Presence of native limbal stromal cells increases the expansion efficiency of limbal stem/progenitor cells in culture.

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Public Summary:
Niche factors are important in the maintenance and regulation of stem cells. Limbal stromal cells are potentially a component of limbal stem cell (LSC) niche. We investigated the role of the limbal stromal cells in the ex vivo expansion of limbal stem/progenitor cells. Limbal epithelial cells were cultured as single-cell suspension and cell clusters from dispase II or collagenase A (ColA), or tissue explant. ColA isolated limbal stromal cells along with limbal epithelial cells. In the presence of limbal stromal cells, a higher absolute number of p63alpha(bright) cells ($p < 0.05$) and a higher proportion of K14 positive epithelial cells were obtained from both ColA and explant tissue cultures. Expansion of the stem/progenitor population from dispase isolation was more efficient in the form of cell clusters than single cell suspension based on the absolute number of p63alpha(bright) cells. Expansion of the stem cell population is similar in the single cell and cell cluster cultures that are derived from ColA isolation. Our finding suggests that limbal stromal cells and an intact cell-cell contact help to maintain LSCs in an undifferentiated state in vitro during expansion.

Scientific Abstract:
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